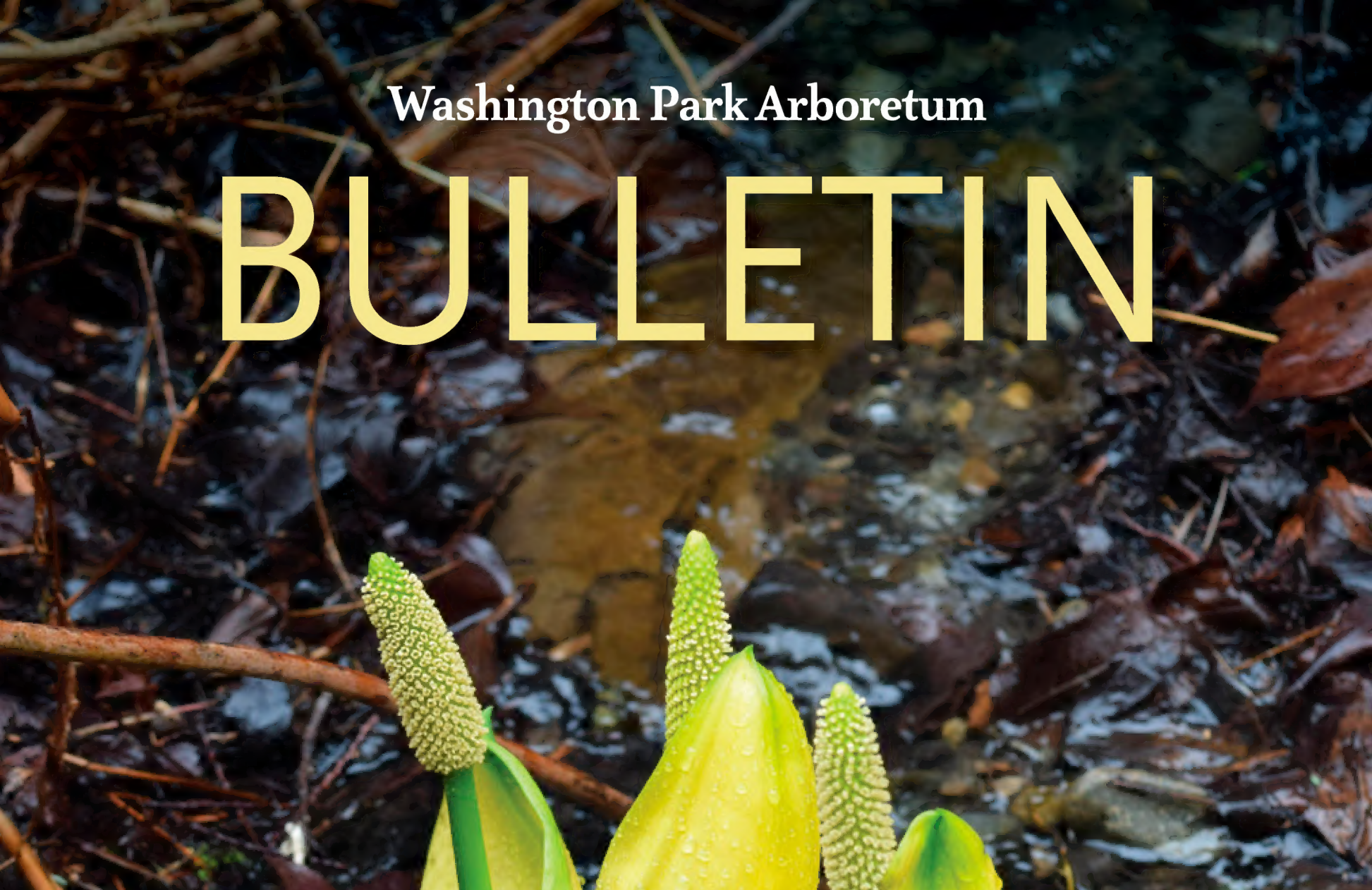
Washington Park Arboretum

BULLETIN



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Washington Park Arboretum

The Arboretum is a 230-acre dynamic garden of trees and shrubs, displaying internationally renowned collections of oaks, conifers, camellias, Japanese and other maples, hollies and a profusion of woody plants from the Pacific Northwest and around the world. Aesthetic enjoyment gracefully co-exists with science in this spectacular urban green space on the shores of Lake Washington. Visitors come to learn, explore, relax or reflect in Seattle's largest public garden.

The Washington Park Arboretum is managed cooperatively by the University of Washington Botanic Gardens and Seattle Parks and Recreation; the Arboretum Foundation is its major support organization.

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ABOVE: The intepretive shelter at the Pacific Connections Garden, photographed in late May, with lupines (*Lupinus* species), Chinese snowball (*Viburnum macrocephalum*), and Chilean fire tree (*Embothrium coccineum*) in bloom. (Photo by Niall Dunne)

ON THE COVER: The western skunk cabbage, or swamp lantern *(Lysichiton americanus)*, blooming by the Woodland Garden stream in early spring. (Photo by Niall Dunne)

Spring Forward

Each year, as the air softens and it's time to adjust the clocks, I rely on the clever saying "spring forward" to point me in the right direction. The saying seems doubly fitting for the Arboretum this spring, as we forge ahead with a great sense of energy and enthusiasm on many fronts.

Let's start with some news about several inspiring gifts. Long-time volunteer Mary Ellen Mulder and her husband, Gordon Mulder, made a catalytic gift for the restoration of iconic Rhododendron Glen. (See associated article in this issue!) Another long-time friend of the Arboretum furthered their commitment to the transformative work along Lake Washington Boulevard that began in 2018. And just last week, the Arboretum Foundation received a wonderful unrestricted bequest from the estate of Laurel Johnson that will bolster our endowment. The impact of these generous gifts will be seen and appreciated by our community for generations.

As Arboretum supporters, you are also helping us spring forward in other exciting ways. February's Opening Night Party, "Mediterranean Dreams," generated a record $324,000, while providing a fitting platform for honoring 80 years of service by our Arboretum Foundation Units. Our seasonal volunteer programs are all back in the saddle and preparing for a great year ahead, and many of you responded to a recent membership survey that will improve the ways we communicate with you.

So THANK YOU for propelling the Arboretum forward. (And for the record, we do not intend to fall back!)

Jane Stonecipher
Interim Director, Arboretum Foundation

Rhododendron adenopodum **blooming in upper Rhododendron Glen in April. (Photo by Niall Dunne)**

ELEMENTS OF DESIGN

Four Fundamentals for Unifying My Garden

By Barbara Blossom Ashmun

Purple repeats on a bench and nearby hut in a pleasing rhythm.

My biggest horticultural challenge has been to make peace between my passion to grow every variety of plant and my need for a beautiful, unified garden. I can't resist planting just one more riveting dwarf conifer, just one more dazzling rose. However, to make my garden look more like a painting and less like a botanical collection, I've learned to follow a few artistic guidelines. My approach is simple, yet not easy, but definitely worthwhile.

Repetition of angled rooflines help unify the garden.

REPEAT SHAPES

Repetition is key! Like singing the refrain of a favorite song, I enjoy seeing the same shapes repeated in a garden. It's fun to play around and place the same or even similar shapes at intervals to create a sense of orderliness.

First I look around for well-defined forms that already stand out in pre-existing structures and paths. For example, an older hut in my garden has a distinctively peaked roof, so I asked the builder to repeat that shape in a new potting shed.

Purple clematis cultivars are used to repeat the author's favorite color in the garden.

When a neighbor built a new addition that looms over my back yard, I was distressed, yet I was very glad that their roofline repeats the very same shape! The three peaks echo one another in a unifying rhythm. Even farther away, beyond my property, ancient sequoias and tall conifers repeat the same shape. This "borrowed landscape" adds welcome depth to my garden, in addition to the unifying benefit of repetition.

The same guideline is true for the shape of my paths and the frames of my beds. I like curves in the garden, so much so that I've edged the beds with deep S-curves and punctuated the lawn with four generous, circular island beds. Whenever possible I choose round ceramic containers and rounded arbors that repeat the curved lines. All those similar shapes help pull the garden into a cohesive whole.

REPEAT COLORS

From the time I discovered finger paints and crayons, I have had a love affair with color. As a gardener, addicted at first to flowers, I grew every kind of annual, perennial, rose, hydrangea, viburnum and camellia. When I discovered the beauty of foliage and texture, I collected ginkgoes, ferns, hostas, conifers, Japanese maples. . . . Oy! You can picture the pandemonium of colors.

Eventually, to create a more peaceful garden, I calmed things down by purposefully adding

Coppertina® ninebark and Bowles' golden grass repeat a color combination that occurs throughout the garden.

golden, burgundy and silvery-blue foliage at regular intervals. The burgundy tints of purple smoke tree (*Cotinus* 'Grace'), Coppertina® ninebark (*Physocarpus opulifolius* 'Mindia'), and 'Hubb's Red Willow' Japanese maple repeat to unify the upper back yard. Golden cypresses, golden-variegated pines, and chartreuse hebes glow at intervals like spotlights leading the way. Silvery-blue dwarf firs, hebes and sedums unify the beds and add a cooling touch. These three foliage colors are not only compatible with each other, but they also mediate between the vibrant array of flowers.

Even so, I find pink flowers the trickiest to combine with other colors: I cringe when they bloom beside brilliant yellow and neon orange! My happiest solution is combining pink flowers with white ones and sticking to solid green and white-variegated green foliage. I've dedicated one bed to this color scheme using varieties of rose-of-Sharon, *Camellia*, *Abelia*, and *Pieris* with pink flowers, together with pink queen-of-the-prairie (*Filipendula rubra*), white *Astrantia major*, white *Gaura lindheimerii*, several hostas with white-edged leaves, and an assortment of lacy ferns.

I love purple most of all and grow as many purple flowers as I can find, especially varieties of clematis like 'Rooguchi', 'Etoile Violette', 'Gypsy Queen', and 'Polish Spirit'. *Salvia* 'Amistad', *Stachys macrantha*, and *Allium* 'Purple Sensation' are also favorites. I painted my benches and chairs purple and trimmed one outbuilding with purple. I have no restraint when it comes to purple, but fortunately it's another

Purple smoke trees are also used to repeat the burgundy-gold foliage pattern.

Red hot pokers, daylilies, salvias and geraniums unify the back garden through a summer seasonal focus.

way to unify my garden and marries well with most other colors.

SEASONAL FOCUS

The best example of unity I've ever come upon was in England, where a generous walled garden room was dedicated to autumn's beauty. That restraint created a surge of color, texture and form that climaxed in the fall. I followed that lead in a modified way by aiming for two seasons of interest.

Winter and spring dominate my front garden through plantings of red and yellow-twig dogwood shrubs, evergreen *Pieris*, *Fatsia*, *Schefflera* and *Nandina*, and masses of *Hellebore*, *Epimedium*, winter-flowering *Cyclamen*, and *Narcissus* 'Jet Fire.'

Stars of the summer and fall garden bloom in my back garden—roses, hydrangeas, daylilies, pokers, *Agastache*, *Salvia*, hardy geraniums, clematis and rose-of-Sharon—as I spend more time there from June through October. Figs, grapes, plums and apples ripen there, too, for easy picking on a summer day when I'm not ready to go inside for lunch.

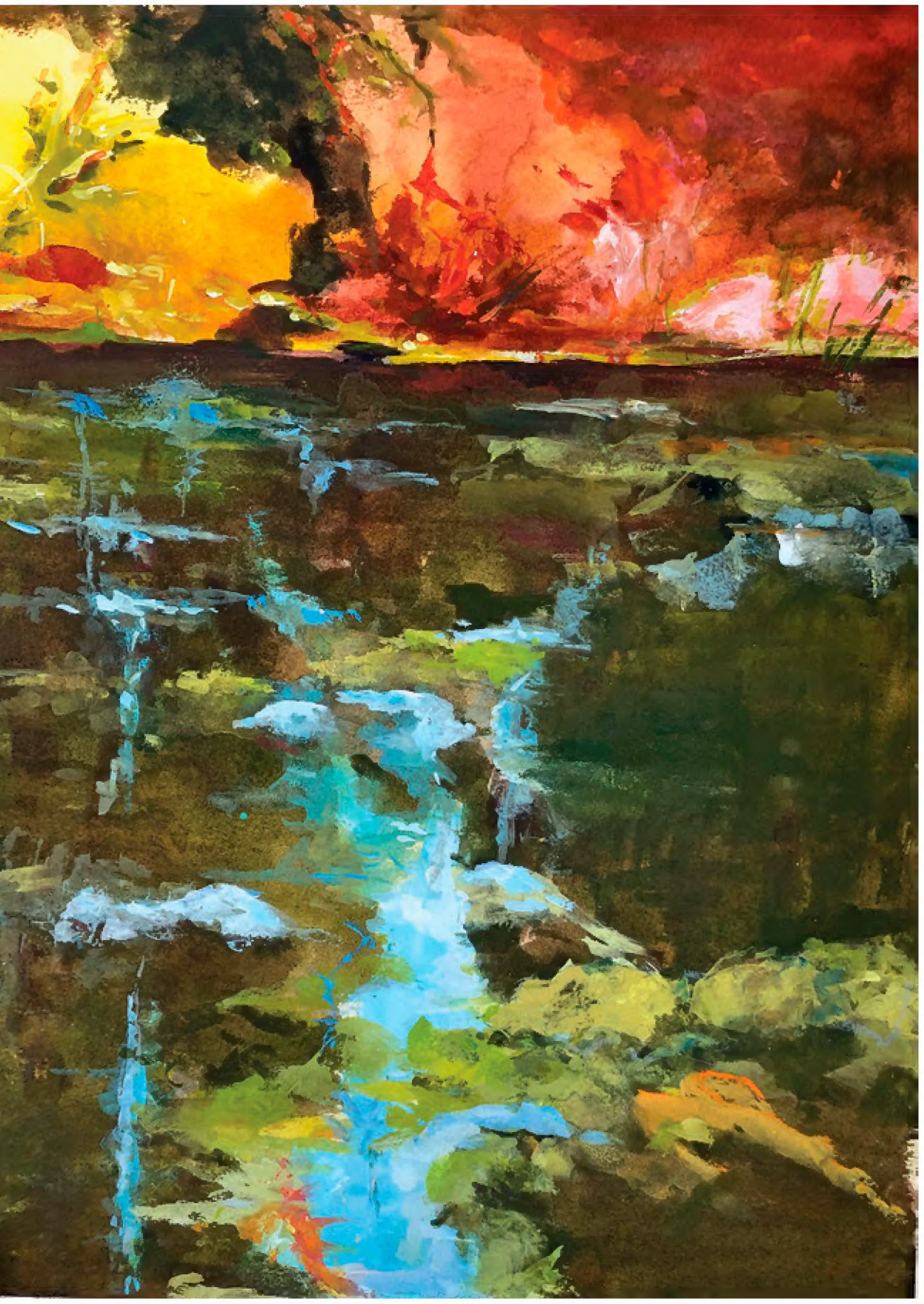
GARDEN STYLE

If you're attracted to one particular garden style, say Asian, tropical, cottage, contemporary or Mediterranean—and you stick with it—your garden will feel unified even with a diversity of plant life.

I wish I could be that disciplined, but my tastes keep changing, and my garden has evolved over time. When I began gardening in the 1970s, the cottage style was popular, and it fit my love for billowing floral color. By the year 2000 my big question was, "How can I make gardening more joyful and less exhausting?" And so began my quest for shrubs and perennials that would be easier to maintain as I aged. The cottage style gradually melted away in favor of a more eclectic fusion of Asian, contemporary, and a style that I wrote a whole book about: "Garden Retreats: Creating an Outdoor Sanctuary." What I love most about my own garden now is its overall tranquil atmosphere.

Whether you stick to one style or combine many—whether you favor a woodland garden, a bird haven, or an edible garden—if you garden from a place of love, your personal style will emerge with beauty that's unique and satisfying.

Barbara Blossom Ashmun has written seven gardening books, most recently "Love Letters to My Garden," a collection of essays about the joys and wonders, disappointments and transformations that color a gardener's life. She wrote a column for the "Portland Tribune" from 2004 through 2011 and was a contributing editor for "Fine Gardening" for many years. Her essays have appeared in "GreenPrints," "Pacific Horticulture," the "Chicken Soup" series, and "Women Reinvented."



IN THE DEPTHS

A PAINTING BY
JOSI CALLAN

In fall 2018, artist Josi Callan began a series of seasonal, impressionist paintings of the lower pond in the Woodland Garden at Washington Park Arboretum. The perspective is looking eastward over the water into the woods from the small wooden platform on the west side of the pond. Josi paints on-site and then uses reference photos to complete her paintings in the studio. "In the Depths," her fall installment in the series, is a 12-by-16-inch watercolor and gouache.

JOSI CALLAN has devoted her life to the enhancement of the arts. She served as the CEO of the Experience Music Project, in Seattle, and was a founding director and CEO of the Museum of Glass in Tacoma, Washington. She was also the director of the San Jose Museum of Art. In 2010, she returned to her first love of painting and has been a full-time artist since. She is a member of Oil Painters of America and has participated in numerous juried exhibitions. In Washington state, she is represented by Gallery Row, Gig Harbor. Visit www.josicallanart.com.

Reference photo by Dwight Phillips

HIDDEN TREASURE OF THE ARBORETUM

Tetracentron sinense

By Daniel J. Hinkley

In the autumn of 1983, I moved into the endearing Stone Cottage at the south end of Washington Park Arboretum, along with an equally endearing terrier named Emerson, while beginning my Master's degree at the nascent Center for Urban Horticulture. (For historical reference, Director Emeritus Brian Mulligan was then still a frequent visitor to the Arboretum; however, sadly, Joe Witt, with whom I was to study, had become ill that autumn and would pass away the following spring.)

During a harvest moon that October, Emerson and I took a nighttime stroll through the trails of the Arboretum's remarkable collection of plants. I shall never forget seeing for the first time the intriguing silhouette, against a moonlit sky, of heart-shaped leaves held along branches of a tree I did not recognize. I returned the following morning to inquire of its identity.

I had been standing the previous evening under a specimen of *Tetracentron sinense*, a deciduous tree that possesses—along with a handsome presence in foliage and flower—a bit of botanical intrigue and is encountered far too infrequently in American horticulture.

Tetracentron sinense is a monotypic species (meaning it's the only species in its genus) native to central and western China, the eastern Himalaya, and northern Vietnam. Its genus name refers to the flowers, which cluster in groups of four along pendulous spikes in the summertime. The tiny, green flowers aren't much to look at by themselves, but the catkin-like spikes grow up to six inches and offer an intriguing contrast to the foliage.

A Botanical Oddball

A loner in its own genus, *Tetracentron* also once inhabited its own family. But it now shares rank with *Trochodendron aralioides*—the handsome and better-known Japanese parasol or wheel tree—the only other member of the Trochodendraceae. Species of both genera, now extinct, are found preserved as fossils in the Okanagan Highlands of Eastern Washington and British Columbia. It was not by accident that both *Trochodendron* and *Tetracentron* were planted cheek by jowl in our arboretum, east of the entrance to Loderi Valley, just south of the Woodland Garden's upper pond.

Now for the intrigue: *Tetracentron* and *Trochodendron* are very unusual because they both share an absence of vessel elements—a water-conducting tissue generally associated with more evolutionarily advanced angiosperms, or flowering plants. Instead, they solely rely on tracheids, a less-efficient piping system generally associated with conifers. This led botanists to rank the plants as "primitive" early angiosperms. Recent taxonomic research indicates, however, that both genera are not nearly as ancient as they had been pretending to be. It now appears their ancestral lines may have arisen from a foundation of more highly advanced flowering plants.

Tetracentron sinense was first described by Augustine Henry in Hubei Province, China, in 1889. It was introduced to cultivation in England by E.H. Wilson in 1901—in fact during the same expedition that yielded the fabled dove tree, *Davidia involucrata*. The source of the two oldest specimens at Washington Park Arboretum—one of which was the tree I visited on my moonlit walk—was Caerhays Castle in Cornwall, whose own specimen was believed to be one of the largest of its kind in Europe in 1975. Though the Williams family of Caerhays were patrons to Wilson's contemporary, George Forrest, it is indeed possible that our trees are directly related to Wilson's original collection. (When I wrote Caerhays to inquire about their *Tetracentron*, I received the sad news from Charles Williams that their record specimen was blown to the ground in the 1990 hurricane.)

I have collected and successfully germinated the seed of *Tetracentron* from several separate excursions to Sichuan, Guizhou and Hubei Provinces in China, as well as to northern Vietnam. The resulting trees grow at Heronswood Garden in Kingston, my personal garden in Indianola, and the landscape of the new Life Sciences Building on the UW campus.

Deserving Greater Recognition

Tetracentron sinense is a medium-sized tree, favoring moist, well-drained soil, full sun to light, dappled shade, and a somewhat sheltered spot. In late spring, the large (up to four-inch-wide), serrated, heart-shaped leaves unfold with a metallic luster overlay, later diminishing to dark green throughout summer.

Though I have seen specimens in extreme northeastern Sichuan with exceedingly ornamental autumn tones of rich gamboge, I have not achieved that effect in cultivation. Generally, in a good year, the leaves transition to a decent amber and a flicker or two of flame before falling. Each leaf is held singly on a spur that gains in length each year, thus creating that signature silhouette I so admired 36 years ago.

The flower spikes dangle from the spurs in mid-summer and can remain attached throughout the winter. I have lost track of how many visitors to my garden have stopped to ask the identity of the tree when in flower or during its winter nakedness, underscoring its need for greater recognition. The Arboretum's two oldest specimens (it has eight altogether; see "*Tetracentron* in the Arboretum") date to 1962 and have reached about 35 feet in height, while my trio at Windcliff have achieved approximately 25 feet in 18 years.

Without a doubt, much of the tree's scarcity in gardens is due to its difficulty to propagate. (Indeed, the species is now rare in its native habitat, in part because of a poor ability to regenerate.) I unsuccessfully attempted softwood cuttings from the specimens at the Arboretum for several years. Eventually, I imported a young seedling from England whose juvenility allowed for easier rooting. Heronswood Nursery offered these cutting-grown plants for several years beginning in 1992. In 2000, I successfully collected seed from staggeringly large specimens

on the slopes of Emei Shan, in Sichuan Province, and this solved my propagation problem—at least temporarily. Interestingly, the offspring of these plants, which grow in my home garden, do not produce viable seed.

When my husband, Robert, and I constructed our home in 2003, we commissioned artist Wendy Armstrong to make a lamp for our library, fashioning from copper the profile of a branch of *Tetracentron*. At night, when the house is dark and the lamp turned to its softest setting, I am again transported to that evening in 1983 at the Arboretum, with my beloved Emerson, when I first made the acquaintance of this aristocratic tree.

Daniel J. Hinkley is an ardent supporter of Washington Park Arboretum and a long-serving member of the "Bulletin" Editorial Board. He writes, lectures, consults and spends each autumn in remote areas looking for new additions for our gardens. He and his husband, Robert L. Jones, tend their personal garden, Windcliff, near Indianola, Washington.

Tetracentron in the Arboretum

According to UW Botanic Gardens curator Ray Larson, the Arboretum currently has eight specimens of *Tetracentron sinense*. Our two oldest specimens, located just north of the east gate to Loderi Valley (along Arboretum Drive, directly south of the upper Woodland Garden pond), date to 1962. They were received from the U.S. National Arboretum in Washington, D.C., which raised them from seed originally given to Brian Mulligan by F.J. Williams of Caerhays Castle, in Cornwall, England.

Of all our specimens, they produce the most flowers, says Ray. "We've received several collection requests for the flowers in the past few years, as they are being used to study flowering morphology and evolutionary development in this unusual and 'primitive' species."

Three other specimens were planted in 1995 in the Woodland Garden, just to the west of the older trees. Seed for these came in 1991 from Steven Roesch, a collector of unusual plants based in New Berlin, Wisconsin. Two of the specimens are still in their original location and doing reasonably well in the shady, Douglas fir understory. In 1998, one was moved to an open, sunnier, irrigated location adjacent Arboretum Drive, just to the north of the older trees, and it has thrived—especially now that it receives regular watering in summer.

The three other specimens in the Arboretum were donated by Steve Hootman, curator of the Rhododendron Species Botanical Garden, in Federal Way. One plant, received as a seedling in 2007, grows near the top of Rhododendron Glen. The other two, received in 2018 and ranging from three to six feet tall, have been planted near the Arboretum Loop Trail, within the footprint of the future China/Emei Shan Forest of Pacific Connections.

Sweet Woodruff: Shade-Loving Groundcover and Aromatic Herb

Photo courtesy Björn Traeger/Wikimedia Commons.

By Joni Blackburn

One May morning a few years ago, I was strolling down my garden path with a visitor from Austria when she stooped over and pinched a sprig of sweet woodruff (*Galium odoratum*) and held it to my nose. I detected a faint but distinct sweet hay scent from the crushed leaves.

I had planted this pretty groundcover after admiring its whorled foliage and starlike flowers in the garden of a friend, who dug up a small potful for me. Now it was beginning to spread nicely around the stepping-stones and, less nicely, into nearby astilbes and hostas.

My Austrian friend told me that it was a tradition in Europe to make May wine from the dried leaves of sweet woodruff, or *waldmeister*, as she called it. I had known that some species of *Galium* were used to freshen bed stuffing and church floors in the past, but I had no idea it was used as a culinary and medicinal herb.

Called *Maiwein* or *Maibowle* in Germany, Switzerland and Austria, sweet woodruff–flavored wine or punch is considered a refreshing and salutary spring tonic. We picked a couple of handfuls of sweet woodruff, and my friend rinsed and de-stemmed them and put the leaves in the salad spinner, while I scrounged up a bottle of Riesling. After letting them wilt on a sunny windowsill for a few hours to increase the aromatics, we bruised the leaves a bit and added them to a carafe before pouring in the wine. After a few hours in the fridge and straining through cheesecloth, our May wine made a tasty late-afternoon cocktail that hinted of fresh-mown grass and vanilla.

Though I'd planted *Galium odoratum* for its beauty and usefulness in filling bare spots in my shady garden, I was very happy to find a new use for it. The aromatic compound coumarin gives the leaves their fragrance and flavoring, and it also serves as a fixative in perfume making. The scent is even more pronounced and long lasting in dried leaves, making them a nice addition in potpourri and sachets. It is also thought to repel moths.

In the Middle Ages, sweet woodruff was used to treat a number of ailments, and in modern herbal medicine it is used as an anti-inflammatory and diuretic. As a culinary herb, sweet woodruff is used to flavor ice cream, tea, and, of course, May wine. In Germany, *waldmeister* syrup is sold as a flavoring for beverages of all kinds; in fact, one of its iconic beers, Berliner *weisse*, is often flavored with a shot of this bright-green syrup.

Photo by Blanca Begert, courtesy Brooklyn Botanic Garden.

Cultivation

Beyond its aromatic qualities, sweet woodruff makes a wonderful groundcover in the right place. First of all, it is a very pretty plant. The foliage grows as whorls of lancelike leaves on square stems 8 to 12 inches long and tends to flop over, forming a mat. In May, masses of tiny white, four-petaled flowers bloom above the foliage.

There are several native species of *Galium* (see "Galium of the Pacific Northwest"), but *G. odoratum* is an Old World species—found in Europe, northern Africa and northern Asia—hardy in USDA Zones 4 to 8. Sweet woodruff prefers moist, rich soil in partial to full shade but will tolerate dry and less than optimal soils. It is slow to get started but is likely to creep beyond its borders eventually, requiring mowing or hand weeding to keep it in check. Some species of *Galium* are downright weedy, but sweet woodruff doesn't appear to be rampant. Nevertheless, given the chance, it will naturalize and can be found growing happily on abandoned home sites.

Though it appears dainty, sweet woodruff is tough and can take a little foot traffic if grown among pavers and along paths. In the event the herb is mown, especially if it has dried out some, the area will be filled with a lovely scent, recalling another common name for it, sweet-scented bedstraw. In particularly dry or sunny conditions, it may go dormant but is likely to green up again once the weather cools.

Sources

It's easy to propagate sweet woodruff if you know a fellow gardener who will let you dig up a small clump and replant it. With patience, it's also possible to grow from seed. Potted plants are often available in the spring at nurseries, farmers' markets, and plant sales. Plants can also be ordered online from White Flower Farm, Monrovia, and other nurseries.

Recipe: **May Wine**

10 to 20 sprigs of sweet woodruff
1 bottle of Riesling or other fruity white wine
Fresh strawberries for garnish (optional)

Remove the leaves from the sweet woodruff stems and wash and dry them. Allow them to wilt for a few hours and then crush them with your hands to release the aromatics. Place the leaves in a carafe and add the wine. Cover and refrigerate for several hours to several days. Strain before serving. Garnish with strawberries if desired. Some recipes call for sugar and sparkling wine or brandy to make a punch.

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Joni Blackburn is a former staff copy editor at Brooklyn Botanic Garden.

Galium of the Pacific Northwest

By Niall Dunne

Sweet woodruff (*Galium odoratum*) is just one of over 600 species in the genus *Galium*, whose members are spread all across temperate zones in the Northern and Southern hemispheres. According to the University of Washington Herbarium, 10 native *Galium* species occur in our state alone. A number of Eurasian species are also established here, including sweet woodruff. Indeed, I found a 1999 record in the herbarium database saying that sweet woodruff is growing as a "weed in dense shade" at the north end of our Arboretum. (Calling all *Maiwein* enthusiasts!)

There seems to be some confusion or disagreement about the nativity status of some *Galium* species here. The sticky, not-very-attractive, weedy annual *Galium aparine* (cleavers) is generally accepted as being native, but some argue that introductions of non-native genotypes of this circumpolar species have occurred. I thought I had planted a native *Galium* in my own garden some years ago, but when I tracked down the plant tag, it turned out to be *Galium odoratum* repackaged as a "native of the Northwest." Oh well. I have a lovely patch of it now covering the ground under some native shrubs and I would not describe its behavior as particularly weedy.

Native *Galium* occur in a variety of habitats in the Pacific Northwest, from sea level to the timberline and beyond. I was interested to learn which species might do well and look good in an urban-garden setting, but couldn't find much information. "Bulletin" Editorial Board member Daniel Mount tipped me off to *Galium boreale*, northern bedstraw—an upright perennial that he has grown and admired for its showy, dense terminal clusters of fragrant, creamy-white flowers. Another circumpolar species, it grows the length of our region in meadows, rocky slopes and forest edges.

In his classic "Gardening with Native Plants of the Pacific Northwest," Art Kruckeberg called out *Galium multiflorum* as a choice plant for rock gardens. "It makes a thrifty shrublet with its many short stems in dense tufts from a woody rhizome," wrote Art. "The upper portion of each stem produces a branched flower cluster, which in fruit bears many tiny bristly spurs, the whole effect a smoky halo."

Native Americans found many uses for *Galium*. The Cowichan rubbed cleavers on their hands to remove pitch and used dried plants for starting fires. The Lummi rubbed their bodies with fragrant *Galium triflorum* (a native similar in appearance to sweet woodruff) for perfume. To attract a desirable man, a Quileute woman would press some of his and her hairs together using *G. triflorum* or cleavers.

Sadly, sourcing seed of native *Galium* appears to be difficult. I've tried a bunch of regional native plant nurseries but so far have come up empty.

Niall Dunne is the editor of the "Bulletin."

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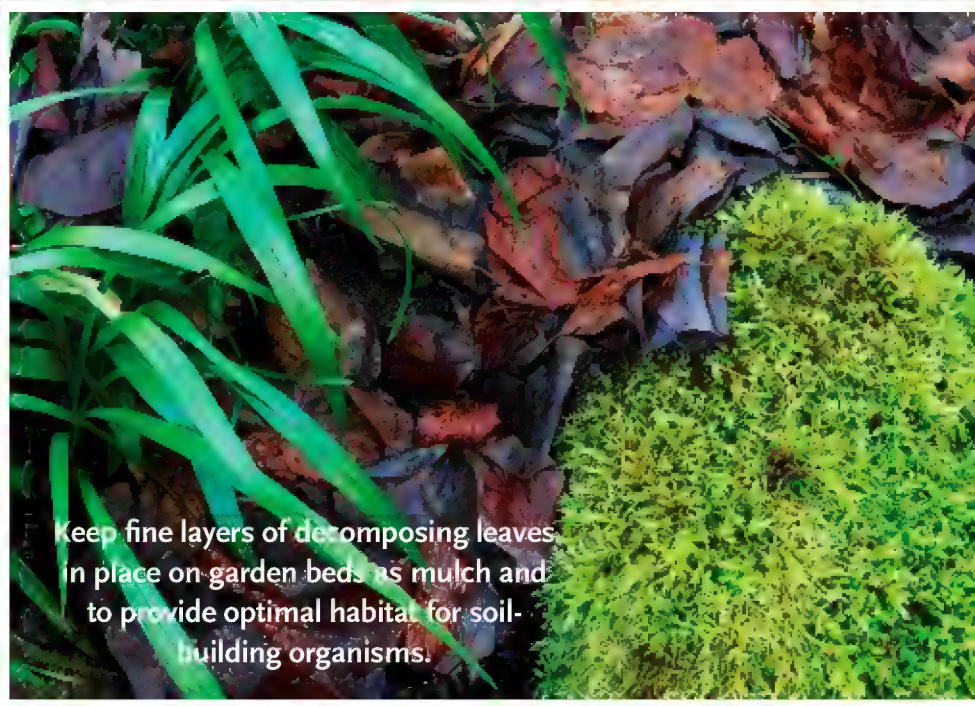
TOP LEFT: *Galium boreale.*
(Photo courtesy Albert Herring/Wikimedia Commons.)

A HEALTHY SOIL WITH LESS TOIL

By Christina Pfeiffer

Our native yellow-spotted millipede (*Harpaphe haydeniana*) feeds on dead leaves and other detritus and is a good indicator species for a healthy mulch layer.



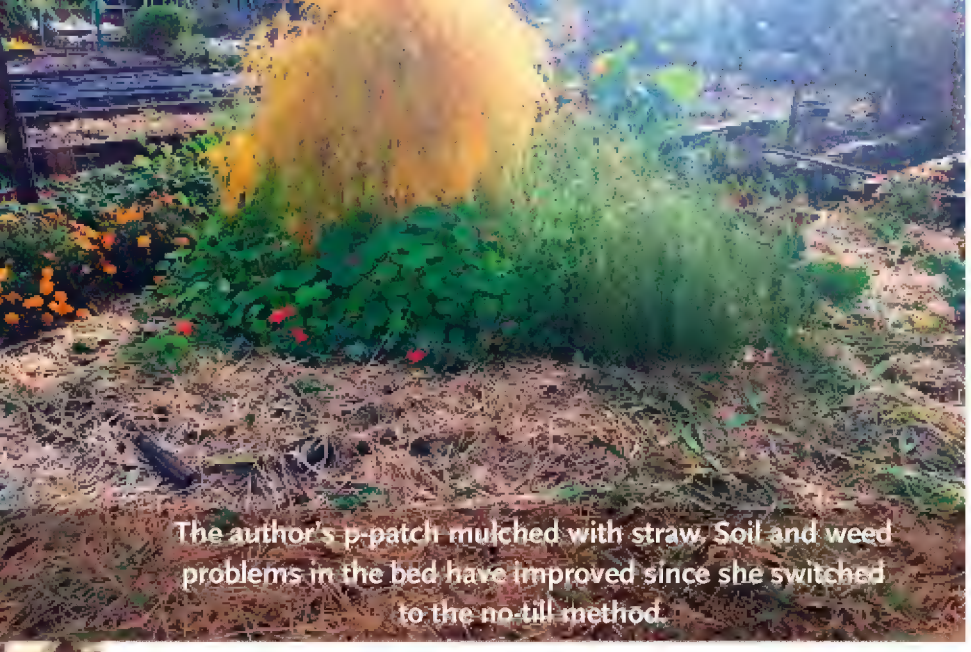
Keep fine layers of decomposing leaves in place on garden beds as mulch and to provide optimal habitat for soil-building organisms.

The usual expectation for preparing new garden beds is that a lot of backbreaking work (or use of machinery) is in store—and that whatever soil is there surely must be improved. Incorporating compost and cultivating the soil to a depth of 24 inches has been a common approach for new plantings of trees and large shrubs. Flower and vegetable beds frequently receive routine digging, amending and rototilling in preparation for a new season's planting. Many gardeners take great pride in a well-cultivated garden bed. For some, the English gardening tradition of double-digging—turning over a series of foot-deep trenches, while loosening and amending the bottom of each trench before backfilling—is the gold standard. I have certainly done my share of such well-intentioned digging over the years.

The same philosophy holds sway when it comes to older, existing landscapes that may no longer be performing well. Often, our first assumption is that it's time to tear everything out and start anew. But this can be a sizeable and costly undertaking, burdened with additional expenditures for watering and establishment in the early years. What's more, it is not uncommon for soil problems and plant mortality to show up in both new and renovated gardens, in spite of the attention given to imported soil mixes and cultivation tactics.

In recent years, perspectives on tillage have begun to change. From large-scale agriculture to small-scale home gardening, there is a growing call from soil scientists to refrain from extensive cultivation and soil disturbance. In the agriculture sector, no-till methods (also known as conservation agriculture) are still largely viewed as alternative. For gardeners, no-till may be confusing, if not counter-intuitive, but the approach is not new or tricky to grasp.

The do-not-disturb stance is about maintaining and building productive soil from the top down, through the decomposition of plant residues and surface-applied organic matter—mimicking the way nature has built soil over much of the planet through the millennia.



The author's p-patch mulched with straw. Soil and weed problems in the bed have improved since she switched to the no-till method.

Apply woodchip mulch as a no-till soil preparation. At planting time, move woodchips aside for each planting hole.

It's about reducing erosion and preserving the natural biodiversity of the soil, which in turn supports the vegetation we rely on for our survival and quality of life.

There's a side benefit, too. Intensive cultivation—whether by machine or hand—is not only hard on the soil and the fauna and flora that reside within, but it can also be tough on the gardener. Having reached a certain maturity in my gardening life—one that comes with less agility for the kind of digging I eagerly took on in years past—I'm beginning to find low-impact methods tremendously appealing.

History & How-To of No-Till

No-till gardening has been around for some time. In the 1940s, Ruth Stout gave up having her New England vegetable plot plowed every spring, out of frustration with the unreliability of both the weather and the plowman. She began planting seeds into the existing soil when the time was right for germination, started experimenting with old hay bales as mulch, and discovered she could have a more productive and drought-resilient garden without all that digging. Her "no-work gardening method" was to keep a thick covering of mulch on her vegetable and flower gardens through all the seasons, replenishing the layer when it had decomposed.

The mulch was kept between the rows. Old corn stalks and the remains of harvested plants were laid down as part of the mulch layer. She didn't plow, dig, use cover crops, weed, keep a compost pile, water or spray. With her success and the interest her productive gardens drew, Stout went on to write humorous and informative books and articles that were influential in the organic gardening movement during the 1970s and are still in circulation today. "How to Have a Green Thumb Without an Aching Back: A New Method of Mulch Gardening" (1955) remains a classic and timely title.

The late Jan Pirzio-Biroli, former naturalist at Washington Park Arboretum, once told me how she and her husband turned the blackberry- and brush-filled lot they had acquired in the 1950s into their own Arboretum-like garden by dumping large piles of arborist woodchips where new garden beds were to go. While they were busy attending to other matters, the woodchip piles quietly did the work of eliminating weeds and conditioning the soil. When it came time to plant, the ground was rich and friable beneath the piles. Woodchips at the very bottom of the piles had turned to compost, and the remaining partially composted woodchips were ready to be spread as mulch around the new trees and shrubs.

Mulch is probably most recognized for the benefits of weed suppression and moisture retention. (Some only consider its aesthetic appeal.) In reality, mulch—the organic variety—supports many more essential garden and environmental functions than may be evident at first glance.

A growing body of research on soil ecosystems reveals there is a lot more going on below ground than was previously understood. It includes new revelations about the complexities of the soil ecosystem and its relationships with plants, how the soil ecosystem is affected by what it is covered with, and how routine disturbance depletes soil vitality and leads to erosion in the long run. It turns out that much of our well-intended rototilling, hoeing and digging may not be so productive after all!

Wood-chip mulch piles staged for spreading in the Arboretum. Mulching is a key technique for soil care and weed suppression here.

Invasive blackberry along Arboretum Creek was mowed back, and a deep layer of wood-chip mulch was laid down to prep the soil for new native plantings.

Restoring Compacted Soil Under Trees

But what about for soil that's been damaged through compaction? For compacted soil beneath established trees and shrubs that we wish to keep, hoes and rototillers are not an option anyway. If you have the means, you can pay a certified arborist to use a pneumatic device called an air spade to gently break up the soil and blend in some compost around the roots. (This treatment can be especially helpful for highly valued, stressed trees.) However, recent research shows that Ruth Stout–style mulching can provide a low-cost—if gradual—solution.

In 2014, scientists at the University of Wisconsin–Stevens Point and the Morton Arboretum studied the effects of surface-applied treatments on compacted soil around established trees. They compared six different treatments on compacted soil planted with red maple (*Acer rubrum*) and river birch (*Betula nigra*): water (control), a commercial biological product (including bacteria, maltodextrin, seaweed and humic acids), aerated compost tea, 30-10-7 N-P-K fertilizer, one-inch top dressing of compost, and a six-inch application of hardwood woodchips. After five years of treatments, in comparison with the control trees, there was a 170 percent increase in tree biomass with the woodchip treatment, far exceeding the compost (82 percent) and fertilizer (69 percent) treatments. Trees treated with aerated compost tea and the commercial biological product displayed similar growth rates to the control trees.

The greatest improvement to both tree growth and soil condition came from woodchips, followed by the compost top dressing. Woodchip mulch made the biggest difference toward reducing compaction and increasing soil moisture, while compost application resulted in greater organic matter content and microbial activity. The effectiveness of the compost and mulch applications was attributed to the resulting increase in biological activity of the soil-building organisms. The researchers noted that using a combination of woodchips and compost would likely yield even greater benefits.

This made me smile. During my tenure as the horticulturist at Washington Park Arboretum, we began using a topdressing of compost combined with woodchip mulch to treat trees with symptoms of root stress, with the idea it would foster conditions similar to natural woodland soil profiles. Arborists have long known that woodchip mulch is beneficial to trees. This research quantifies just how effective it is not only for tree health but also as a powerful agent for soil improvement.

Compacted Soil in New Landscapes

It typically takes a few years of surface applications with organic matter to achieve significant improvement in compacted or depleted soils. On highly compacted soil, it can take even longer. When higher fertility composts, fertilizer, or Class A Certified biosolids are applied, soil biological activity gets a jump start, and the time period for soil improvement is reduced.

Of course, if you have a new landscape to plant, waiting for a few years to elapse is impractical, and so cultivation to break up severe compaction (such as that caused by construction impacts) is an important first step in restoring damaged soil. That said, current recommendations are moving away from extensive digging, grading and rototilling in favor of using a backhoe bucket in a

scoop-and-dump action to break up compaction and introduce compost with less overall manipulation of the soil. Once the soil has been roughly broken up, it is ready for planting and surface treatments with compost and/or mulch.

These lower-impact techniques are being studied at Cornell University's Urban Horticulture Institute and Virginia Tech's Urban Forest Ecosystems Lab (in their "Soil Profile Rebuilding" project). The techniques help improve soil permeability, increase soil carbon content, and support nature's processes of soil building. They show greater promise for long-term effectiveness than methods that involve extensive cultivation and amendments, which tend to lead to subsidence and compaction over time.

Hidden Impacts of Tilling

Historically, "working in" organic matter has been seen as a sure-fire way of improving the soil. But each time we turn and handle the soil, it can disrupt or damage the soil-building organisms that live on this organic matter—as well as each other—and do the heavy lifting of soil improvement.

Most of these organisms are not readily visible when soil is turned: bacteria, protozoa, fungi, nematodes, springtails, mites and so many more. They work at the base of the food web, breaking down organic matter and releasing key nutrients that are then available to roots and other soil organisms. More noticeable are the detritivores—earthworms, sow bugs, millipedes and others—that chomp through leaf litter and woody material and open small channels in the soil through their movements.

Overworking the soil severs beneficial plant root/fungal connections (mycorrhizal networks) and destroys habitat for soil biota. It also can damage soil structure, closing off the pores in the soil that carry oxygen and water to plant roots and other soil inhabitants. Although soil appears "fluffier" after rototilling, it can end up even more compacted after settling. Tillage also accelerates the breakdown of soil carbon, leading to increased emissions of the greenhouse gases carbon dioxide and nitrous oxide.

Mulch Well and Your Garden Will Thrive

The simplest path to better soil for permanent landscapes, as well as vegetable and flower gardens, is an annual application of coarse organic mulch. With it, you provide food for your soil organisms, which will restore and maintain your soil structure and provide nutrition and other benefits for your plants. Applying coarse organic mulch at the surface also suppresses weeds, retains soil moisture, and protects against erosion and compaction.

Make sure your mulch has varied content and a coarse texture. Coarse-textured mulch contains recognizable pieces of wood fiber and/or broken-down leaves. Woody mulches are optimal for mixed plantings of trees, shrubs and perennials. Stay away from weed barrier fabrics (and even cardboard sheeting), which interfere with air and moisture exchange as well as biological activity. Shredded leaves and straw are good choices for vegetable and flower gardens. Recycle organic debris back into your garden. Allow some of your fallen leaves to lie in place beneath garden plants. Employ the "chop and drop" method, discreetly returning clean garden trimmings back into garden beds as you work.

We cannot make better soil than nature does, so let's let nature build our soil for us! By mulching well, we support nature's soil builders. Save your back, and let them do their work. Less toil, better soil.

Christina Pfeiffer is a horticulture consultant, educator and ISA Certified Arborist with over 35 years of experience. She is author, with Mary Robson, of "Pacific Northwest Month-by-Month Gardening" (Cool Springs Press, 2017) and also serves on the "Bulletin" Editorial Board.

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The stairs down from the "landing" in the Upper Glen.

Restoring Rhododendron Glen

A Transformative Gift Will Revitalize the Plantings, Trails and Watershed

TEXT BY JANE STONECIPHER | PHOTOS BY NIALL DUNNE

Dating to the late 1930s, Rhododendron Glen has long been one of the most special and beloved places in Washington Park Arboretum. It has it all: dramatic topography, tall trees—including four enormous dawn redwoods (*Metasequoia glyptostroboides*)—and a babbling brook, where dramatic sweeps of western skunk cabbage (*Lysichiton americanus*) announce the arrival of spring. And of course, it's filled with beautiful, unusual rhodies—such as *Rhododendron concatenans* and *R. eclecteum*—and companion plants, such as alangium and magnolias.

Western skunk cabbage blooming by the stream in late March.

Over time, however, important parts of the Glen have lost their luster. The canopy has become too dense in places, resulting in a loss of understory plants; trails have deteriorated and are impacting the stream; and key sections of the stream and its associated rock work have silted up and become ill defined. In fact, the original design for the Glen called for an integrated set of water features that were never fully optimized—including the Upper Pond, Lower Azalea Way Pond, and the stream running down the hillside connecting it all and then flowing into Arboretum Creek.

Now, thanks to a very generous gift of $750,000 from long-time Arboretum Foundation volunteer Mary Ellen Mulder and her husband, Gordon Mulder, the partners at the Arboretum have been presented with a unique opportunity to renew and augment this major park landmark. Moreover, because of the project's focus on the stream, there is hope that it will have a cascading effect, generating interest and funding potential for additional, wider-reaching improvements.

"The Rhododendron Glen project has been identified as one of the most important Arboretum Master Plan priorities for the next five years," says UW Botanic Gardens Interim Director Fred Hoyt. "Given its potential to improve the quality of our local waters, we believe that—beyond its immediate benefits—the project has the ability to attract matching funds from state and local organizations. It could even jumpstart significant improvements to the watershed in the entire central part of the Arboretum, including Arboretum Creek and the connections from the Japanese Garden pond."

Site Analysis and Design

With the Mulders' gift—augmented by a recent planning grant from the Seattle Garden Club—the Arboretum partners can now move ahead to the next stage of the process: conducting a comprehensive site analysis and developing a conceptual design. That planning stage is anticipated to begin later this year. The team anticipates that the design will help identify logical phases for the work as well as the interdependencies within various parts of the watershed.

While the design process for the central part of the Glen is being conducted, a joint team from the Arboretum Foundation, UW Botanic Gardens, and Seattle Parks and Recreation will simultaneously identify and begin some clean-up work, site preparation, and replacement plantings. These include eye-catching improvements to the upper and lower entrances to the Glen.

LEFT: The view looking west through the central glen, with the stream running along the left side of the path. Understory plantings here will get a makeover.

THIS PAGE TOP: The Upper Pond in Rhododendron Glen has become silted up and has lost a lot of its definition.

BOTTOM: Blackberry and other weedy vegetation is obscuring the stream that runs from the Upper Pond to the Lower Azalea Way Pond.

Upper Glen Entrance

"As you walk down the stairs from the eastern approach to the Glen, there is a landing area that offers a sweeping view and immediate perspective of the character of this special place," says Jason Morse, Arboretum Foundation board president and landscape architect. "This landing should be the place that begs you to stop and take the perfect postcard photo, but the rhododendrons here have become more sparse over time, with only a few of the prized specimens visible. A new, lushly planted corridor adjacent to the stairs would create a dramatic and noticeable entrance."

A seasonal crew will start removing aggressive groundcovers and weedy species from the area starting in April. This should also uncover some lovely rockwork that has been mostly obscured from view. A gift in memory of Caroline Feiss will augment the funds for additional plantings in the entrance area.

Lower Glen Entrance

With the completion of the Centennial Garden in 2017, many people now choose to enter the Glen from an existing—though newly popular—trail that runs from the outer edge of that garden up the hillside. Increased visitation to the Centennial Garden and use of that trail has brought more attention to the condition of the stream as it channels down into the Azalea Way Pond.

"This area of the stream currently is overgrown with blackberry and other invasive plants that are both unsightly and hide the channel. We'll work to remove the persistent weeds and then define and mulch the area so new plantings that highlight the creek and improve its ecological function can be installed. We can turn this part of the stream into a feature that nicely complements the Centennial Garden," says UW Botanic Gardens Curator Ray Larson.

Central Glen Plantings

When the core parts of the project begin, plantings in the heart of the Glen will also get a makeover.

"During the early years of the Glen, a diverse tapestry of rhododendrons and other woodland garden plants created a dynamic understory to an open tree canopy," says Ray. "Over the years, however, the tree canopy has grown denser, causing the plants below to become increasingly sparse. Flowering decreased or ceased, and plants became leggy and starved for light. A combined approach, including canopy thinning and restoration of the plants at the ground and intermediate levels, will bring new life to this historic open space."

Along with new rhododendrons, Ray says he plans to add mahonias, woodland perennials, additional members of the heather family, and ferns, as well as small specimen trees to build on existing collections of magnolias, snowbells and maples.

Watershed Enhancements

While perhaps less noticeable to the naked eye, the improvements to the watershed may provide the most far-reaching benefits of the project.

"We know there are overall connections between Arboretum Creek and Puget Sound, as well as the connecting flow through Rhododendron Glen and the Woodland Garden and the nearby Japanese Garden Pond," says Fred.

The Rhododendron Glen stream is first observed at the eastern edge of the Arboretum. It is daylighted in some spots and runs through pipes and culverts in others. The stream channel has also been scoured and eroded during storm events between the upper and lower ponds. In its current condition, it picks up runoff from the eroded walls of the lower stream channel, as well as from adjacent trails and the surrounding hillsides. Some of the anticipated improvements would be strategic placement of rocks, the addition of weirs, creation of a catchment pond to settle out any silt, and other mechanisms to clean and reduce the turbidity (cloudiness) of the water before it flows into the Lower Pond.

"The Upper Pond, which sits at the intersection of two well-used trails, offers a potentially lovely birds-eye view down the hill to Azalea Way," says Jason. "However, time has taken its toll on this pond—it has silted up and lost most of its definition. We expect this to be a central focus within the comprehensive design, as well as looking at the areas of the stream above and below."

Improving the quality and flow of the water moving into the Azalea Way Pond will have multiple benefits. It should help ameliorate the conditions that lead to regular summer algal blooms in the pond, and it will have help improve conditions for aquatic life and other wildlife farther downstream in the watershed.

We would like to express our deep gratitude to Mary Ellen and Gordon Mulder for making this project possible. Their gift is a catalytic one that, beyond its immediate and obvious benefits, will enable the Arboretum team to gain additional knowledge to springboard other projects in the watershed. We look forward to further celebrating the Mulders' generosity at the Foundation's June 19th Annual Meeting.

Jane Stonecipher is the interim executive director of the Arboretum Foundation.

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Q&A from the Miller Library's Plant Answer Line

CHEWING UP THE SCENERY

Unusual Ornamental Woody Edibles for Urban Gardens

By Rebecca Alexander

This regular column features Q&A selected and adapted from the Elisabeth C. Miller Library's Plant Answer Line program. If you'd like to ask a plant or gardening question of your own, please call (206) 897-5268 (UW Plant), send it via the library website (www.millerlibrary.org), or email directly to hortlib@uw.edu.

Paw paw, *Asimina triloba.* (Photo by Agnieszka Kwiecien/Wikimedia Commons)

Goji, *Lycium barbarum.* (Photo by Sten Porse/ Wikimedia Commons)

QUESTION: I am trying to grow a "food forest" in a relatively small space, and I am looking for less common fruiting shrubs or small trees that will thrive in the Pacific Northwest and blend well with ornamental plants. I started with several goji berry shrubs, expecting them to grow upright, but they are sprawling wildly. Should I train them? Will they become invasive? Which other plants should I add?

ANSWER: The term *food forest* is associated with the permaculture principles of *forest gardening*. To quote Dave Jacke, author of "Edible Forest Gardens" (2005), a forest garden is "a perennial polyculture of multi-purpose plants." To embrace the concept fully, you would implement a layered design, with canopy trees, lower trees, a shrub layer, an herbaceous layer, the "rhizosphere" (root crops), soil surface plants (cover crop), and a vertical layer (climbing plants). These plants and their associated organisms would form a "beneficial guild"—working together to ensure garden health and productivity. In a smaller garden, you may not have room to include all the different layers, at least to their fullest extent.

Goji May Not be A Go-To

Lycium barbarum (goji, also called wolfberry and boxthorn) may not be an ideal plant to integrate into a food forest, due to its aggressive nature. Native to Asia, this member of the Solanaceae, or nightshade family, has been widely planted around the globe and has become invasive in many regions. (For example, several counties in California list the plant on their invasive species

lists.) A 2008 article by Vern Nelson in "The Oregonian" mentions this tendency and suggests containing the plant in a four-by-five-foot-square support structure. Be aware that "wolfberries take root wherever they touch the ground."

Susanna Lyle's book "Fruit & Nuts" (2006) says these rangy, thorny, vining, deciduous shrubs are short-lived, peaking in berry production at about five years of age and typically living for eight years or so. She advises planting them near a fence or trellis so that they can be trained up it; some sprawling is to be expected. She also says "the extensive root system can help stabilize banks," which you could interpret to mean that removing unwanted plants might be hard work! In "Extraordinary Ornamental Edibles" (2018), Mike Lascelle—a British Columbia gardening author—recommends growing goji berry in a container, or training it as a weeping standard.

Suckering roots are only one way the plant spreads; seeds are another. Goji was the "Plant of the Month" in the "Whatcom County Master Gardeners Weeder's Digest" in August 2006. Author Cheryll Greenwood Kinsley notes that when the plant was first introduced to Europe, people weren't enamored of the fruit, but birds were, and now "the shrub has naturalized in Britain and is listed as a noxious weed on two continents and in at least some parts of several states, including Montana and Wyoming." She recommends keeping the birds away from it to discourage its spread.

Selecting Plants for a Food Forest

With careful plant selection, there is no reason you cannot have a healthy, small food forest of your own. To narrow down choices, you may want to ask yourself, "Who will harvest and consume the fruit?" Are you growing edibles solely for human consumption, or do you wish to attract and feed wildlife as well? If you plan to be the primary consumer, you'll likely need to protect your plants from browsing by other living creatures. Also consider ease of harvesting and palatability. Why plant anything with fierce thorns, or with fruit that is edible but not delectable, when there are so many desirable plants from which to choose? In a small garden, avoid the more aggressive growers, or at least limit them to a specific area of the garden: An edible hedgerow along one side of the garden might be a possibility.

One way to narrow your focus is to select plants that not only yield delicious fruits but also have intrinsic aesthetic appeal. Some woody edible plants are beautiful to grow (and worth including, in my opinion), even though the fruit might not ever ripen for you: I am thinking of pineapple guava (*Acca sellowiana*), olive (*Olea europaea*), and pomegranate (*Punica granatum*). Lee Reich's "Landscaping with Fruit" (2009) will prove useful for plant selection because the author rates each plant on a "luscious landscape index," an admittedly unscientific designation that encapsulates the taste of the fruit, degree of expertise needed to grow it, and the plant's sheer beauty.

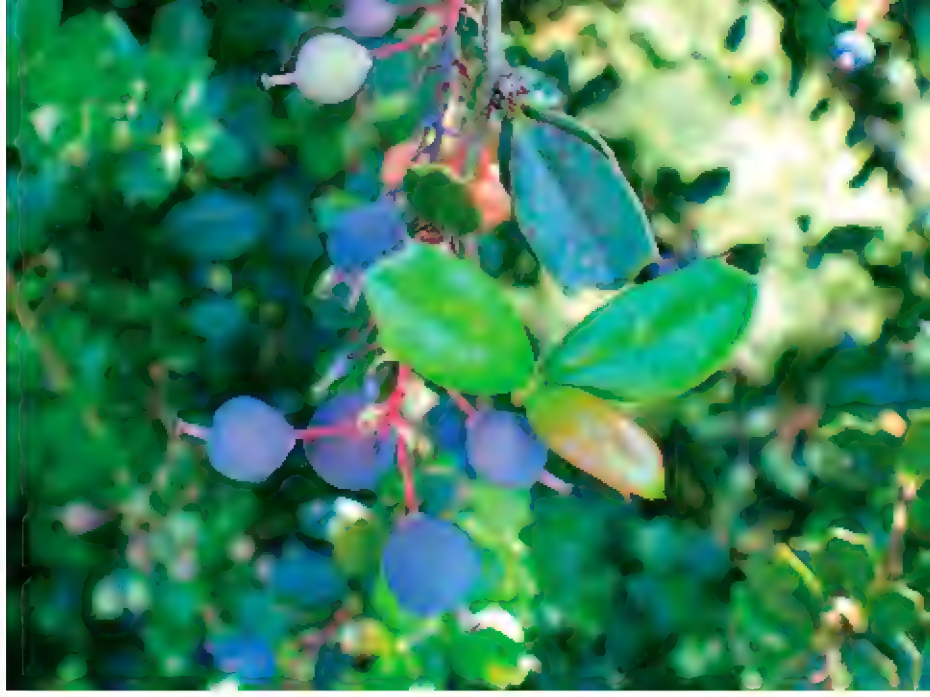
Following are some suggestions to get you started. If you would like to explore an active permaculture forest in Seattle for other ideas, pay a visit to the Beacon Food Forest, adjacent to Jefferson Park on 15th Avenue South and South Dakota Street (https://beaconfoodforest.org).

Suggested Plant List

Aronia melanocarpa (black chokeberry): This vigorous, suckering deciduous shrub from eastern North America grows up to six feet high and wide. Its black autumn berries are sweetest when stored for a few weeks after picking. Lascelle notes a few compact varieties, including

Black chokeberry, *Aronia melanocarpa*. (Photo courtesy Krzysztof Ziarnek/Wikimedia Commons)

Chilean guava, *Ugni molinae.*
(Photo courtesy Sciadopitys/Wikimedia Commons)



Darwin's barberry, *Berberis darwinii.*
(Photo by Krzysztof Ziarnek/Wikimedia Commons)

'Low Scape Mound,' 'Low Scape Hedger,' and 'Iroquois Beauty,' also known as 'Morton'.

Asimina triloba (pawpaw, custard apple): Native to the Southeast, pawpaw is a slow-growing, ornamental small tree (10 to 25 feet tall) related to cherimoya and soursop (*Annona* species). Some describe the brownish-purple flowers as fragrant; others say their odor resembles rancid meat. The fruits are large, kidney bean-shaped berries that have a custardy texture when fully ripe and an intense tropical flavor that melds mango, banana and pineapple. Pawpaw is the largest edible fruit from North America. Reich gives it a top rating. A few varieties are self-fertile, including 'Rebecca's Gold' and 'Sunflower', and for a small garden it makes sense to seek out these.

Berberis darwinii (Darwin's barberry): With its stunning yellow flowers, this upright, evergreen shrub makes a big splash each spring in the Chile Entry Garden at the Arboretum. According to Mike Lascelle, the round, bluish, acidic fruits that develop from its flowers in summer have an essence of fig. Like many *Berberis*, this species is self-fertile, so you only need one plant to get fruit. Note, the plant is thorny, and there are rumors of it escaping cultivation in Oregon and California.

Cornus mas: The grove of Cornelian cherry trees at the Center for Urban Horticulture attracts immigrants from Azerbaijan (where the plant is native), who harvest the sour, astringent fruit to make a cordial, which is said to cure all ills. The red fruit has been part of the human diet since ancient times and is mentioned by Dioscorides and Galen. A plus, I think, are the yellow flowers in spring, which have a friendly essence of wet-dog-at-the-beach. (Top rating in Reich.)

Diospyros kaki (Japanese persimmon): This deciduous, small tree from East Asia grows up to 20 or 30 feet, but compact varieties are available. I have a dwarf cultivar 'Izu' in my small garden. Patience is required with persimmon: It took 18 years for my tree to produce fruit! However, since then, it has had a bumper crop each year. The squat fruits of 'Izu' and 'Fuyu' are non-astringent, unlike those of the acorn-shaped 'Hachiya', and are best eaten when they are fully orange, but before they get soft. Persimmon also rewards the gardener with graceful branches and luscious foliage that turns a rich golden to red color in fall.

Elaeagnus multiflora (also called goumi) and *E. umbellata* (autumn olive/Japanese silverberry): Both of these thorny species from Asia bear fragrant flowers and small red fruits. Lee Reich commends the plants for their beautiful appearance but does not think the rhubarb-like flavor of the fruit is appealing enough to make them a must-have ornamental edible. All *Elaeagnus* plants have distinctive, tiny, silvery-white bumps (scales) on their leaves, branches, and even their fruit. They have a tendency to sucker. Avoid *Elaeagnus angustifolia*, which is on the Washington State Noxious Weed list.

Fuchsia species: Flowers and fruits of plants in the genus *Fuchsia* (native to South America and New Zealand) are edible. According to Lascelle, the slightly bitter flowers are best used as a colorful garnish, and *Fuchsia boliviana* fruit is tastiest,

reminiscent of red table grapes. Harvest fruit from midsummer to fall.

Hippophae rhamnoides (sea buckthorn): Washington State University fruit research describes this extremely thorny shrub from Europe and Asia as tolerant of poor soils and pest- and disease-free. It also sets "many small orange fruits with a citrus-like flavor." Lee Reich cautions that the fruit is nearly inedible when raw, as it is supremely tart. The juice, if sweetened, is delicious, with a flavor like orange and passion-fruit. Because of the thorns, the fruit is difficult to harvest. However, if you like the look of the narrow, silvery leaves contrasting with the bright-orange fruit, it might be sufficiently appealing.

Mespilus germanica (medlar): If you want to mimic a medieval garden, add this small and attractive self-fertile tree, which bears a curious-looking brown fruit with a five-pointed calyx. (The French call it *cul de chien* for its resemblance to the rear end of a dog.) When ripe, the fruit is still too hard for human consumption. There are two ways to "blet"—or soften—your medlars. One is to pick them when they are nearly rotting on the tree (not wise if you have avid squirrels lurking about). The other is to pick them after a few frosts have hit, and then store them in a cool, dry spot for about three weeks, until they soften and are ready to reveal their spicy apple butter flavor. (Top rating in Reich.)

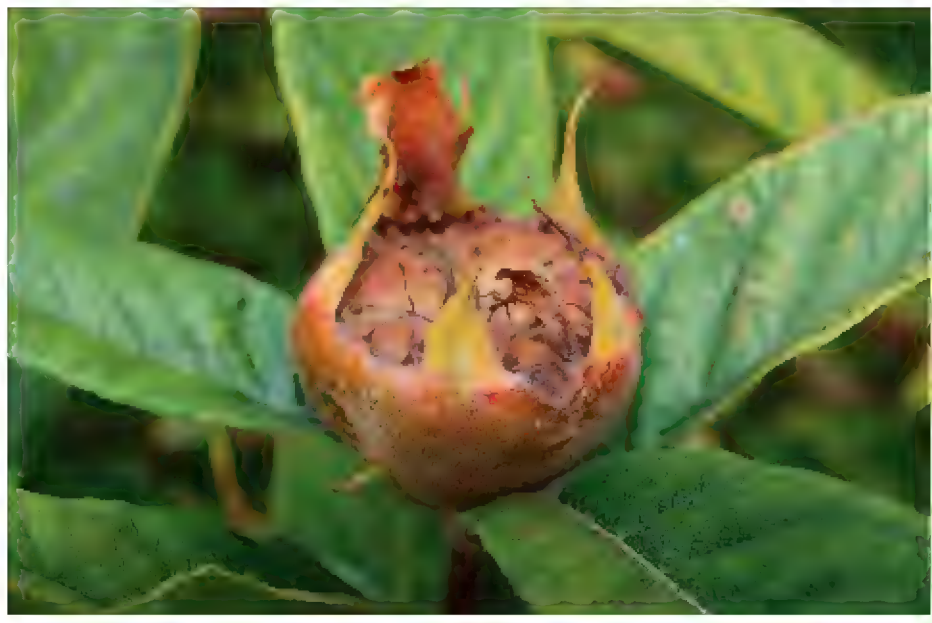
Poncirus trifoliata (trifoliate or hardy orange): I know several gardens in the Seattle area where this prodigiously thorny Chinese plant is growing successfully. It does produce bumpy-skinned citrus fruit, which is not tasty when eaten fresh. However, if stored for several weeks, the fruit can purportedly be juiced or turned into marmalade, or small slices can be used to flavor a gin and tonic. If wiry, zigzaggy branches make your heart sing, this is an ideal choice.

Prunus tomentosa (Nanking cherry): This deciduous shrub from East Asia receives a top rating in Reich's book, but you need two specimens in order to cross-pollinate. The tart-to-sweet red fruits ripen in early summer and are best used in pies, jams and jellies. The plant is a marginal choice for our region because it does best in areas where fall and winter are not so wet.

Punica granatum (pomegranate): The most robust specimens I have seen in Seattle are in the UW Medicinal Herb Garden, where the trees often develop small- to medium-sized fruit that looks harvest-worthy. Most people, however, simply grow this western Asian tree for the vibrant, orange-red flowers and only dream of fruit.

× *Sorbopyrus auricularis* (shipova): This is an intergeneric hybrid between European pear (*Pyrus communis*) and common whitebeam (*Sorbus aria*), an elegant mountain ash. Reich gives it a top rating for landscape appeal, ease of maintenance, longevity, and taste. He does not mention that it takes about seven years to produce fruit! The hybrid came about (it's unclear how) in the early 1600s in the Bollwiller castle garden in Alsace and is propagated by grafting rather than

Sea buckthorn, *Hippophae rhamnoides.* (Photo courtesy Lazaregagnidze/Wikimedia Commons)



Medlar, *Mespilus germanica.* (Photo by Niall Dunne)

Trifoliate orange, *Poncirus trifoliata*.
(Photo courtesy Jebulon/Wikimedia Commons)

Nanking cherry, *Prunus tomentosa*.
(Photo courtesy A. Каóанов/Wikimedia Commons)

by seeds. The fruit is turbinate, or shaped like a spinning top, and about the size of a large apricot. It ripens to a rich yellow with a blush of reddish orange where the sun reaches it. The yellow flesh is similar in flavor to a pear. There is at least one dwarf variety, 'Baby Shipova,' that is six to eight feet at maturity.

Ugni molinae (Chilean guava or strawberry myrtle): An evergreen shrub from the Chile, *Ugni molinae* reaches about six feet in height and half as wide. Its leaves are similar to those of myrtle, and its fragrant cup-shaped flowers are white with a hint of pink. The genus name is derived from the indigenous Mapuche name, *uñi*. The shrub was introduced to England in 1844 and soon became a favorite of Queen Victoria, who enjoyed the fruit, which tastes like a cross between strawberries and guavas. If your garden's microclimate runs cold in winter, grow the plant in a sheltered spot, as *Ugni* is hardy to USDA Zone 8.

Ziziphus jujuba (jujube, red date, Indian date): This Asian tree receives a top rating in Reich, but it needs summer heat to be productive. Lascelle says it is hardy in coastal British Columbia, but the fruit does not ripen until October. Unripe fruits will not ripen off the tree, so wait until they turn reddish brown to pick them. In their native range, jujube fruits are allowed to dry on the tree, but that would not work in our climate. The fresh fruit tastes like apples. In the Pacific Northwest, *Ziziphus* will probably reach between eight to 12 feet tall by six to eight feet wide. It grows larger in warmer climates. Most cultivars are only partly self-fertile. Bearing lax, somewhat thorny branches and yellow-green flowers, the tree is described by Lascelle as "attractive enough."

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Rebecca Alexander is the manager of Reference and Technical Services at the UW Botanic Gardens' Miller Library. She is also a contributing editor to the "Bulletin."

NEW BOOKS
for Pacific Northwest Gardeners

By Brian R. Thompson

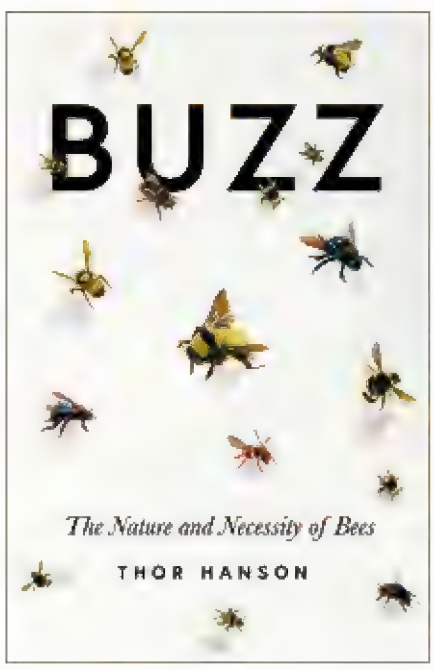
Identify That Arthropod

Are you fascinated by all the tiny, busy creatures that buzz, scuttle and wiggle around your garden? Even if the answer is no, you can still benefit as a gardener by knowing something about these life forms. "Pacific Northwest Insects," by Merrill Peterson, is here to help. This excellent new field guide provides incredible color photos of more than 1200 species native to our region. Despite the book's title, its scope is the phylum Arthropoda, which not only includes all the true insects (bees, beetles, butterflies, flies, etc.), but also centipedes, sow bugs, spider mites, and even spiders and ticks. (Yes, we have those, too!)

The wide scope means this book provides better coverage of the many "bugs" you'll find in your garden. It's the most comprehensive reference for regional invertebrates that we have in the Miller Library collection. The author also recognizes the importance of plants to the insect world and vice versa. "Given the specialized associations between insects and plants, it is no wonder that many entomologists are skilled field botanists."

If you can get past the creepy factor, there are also a lot of fascinating facts to discover. Did you know that moths are a significant food source for grizzly bears in the Rocky Mountains, helping them fatten up for winter hibernation? Or that beetles are the most diverse and numerous order of multicellular animals in the world, making up 20 percent of all species? Many visitors to the Pacific Northwest think we have a relatively limited insect life, but that's not true. We may lack many "huge or gaudily colored insects," but this book will help you identify more than 3000 arthropod species.

The Necessity of Bees



I was very impressed with the story-telling skills of Thor Hanson, which I discovered when reading his "The Triumph of Seeds" (see my review in the Fall 2015 issue of the "Bulletin"). He makes scientific research easy to understand and a fun adventure!

"Buzz: The Nature and Necessity of Bees" is Hanson's newest book. As before, he combines just the right touch of personal, local

experience—he lives on an unidentified island in the Pacific Northwest—with wide-ranging research. For this book, he traveled to Sri Lanka to investigate a bee-like wasp, and to southern Africa, one of the ecosystems where honeybees are native.

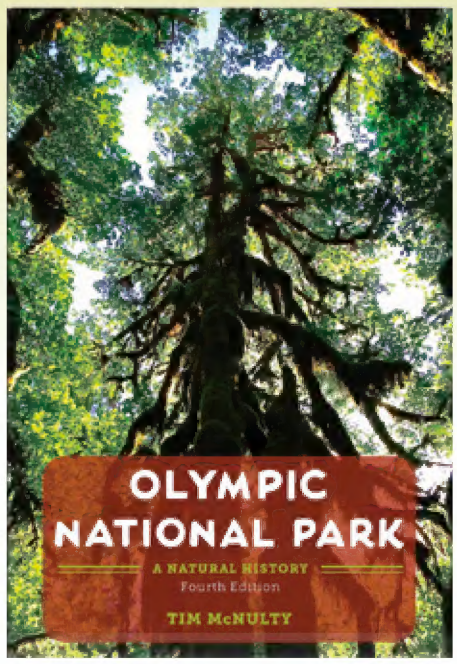
"Bees are the vegetarian descendants of a sphecid wasp ancestor from the mid-Cretaceous. That much is known," writes Hanson. The ancestral wasps were predators, so why and how did bees make this dramatic lifestyle change? This is still a mostly unanswered question, but Hanson seeks out some of the most recent research and insightful researchers to explore the possibilities.

His journeying leads him to participate in "The Bee Course", a nine-day, intensive study set in the Arizona desert in the month of August. Why there and then? Arizona has the highest concentration of bee species (1300) in North America, and unlike tourists, the bees don't mind the heat and are particularly busy during the flush of flowers provided by many cacti and wildflowers at that time of year.

During the course, Hanson becomes smitten with an alkali bee (*Nomia* species), which has an opalescent exoskeleton, "flashing a rainbow of colors that shifted and swirled in the light." While this species is a rare treasure from his visit to Arizona, he discovers later that near Touchet, Washington, alfalfa farmers have learned to create an environment that nurtures native species of alkali bees, which return the favor by pollinating the farmers' crops. This is not a small-scale operation: An estimated 18 to 25 million nesting female alkali bees are scattered over an area of 300 acres.

There are other local connections, too. The author profiles Brian Griffin of Bellingham, well-known amongst gardeners and fruit-growers for commercializing and promoting the use of orchard mason bees. Hanson also makes his own discovery, finding a cliff on an island neighboring his own that is home to 400 thousand digger bees—the largest known population of such bees—amongst a complex community of several other types of bees, wasps, flies and beetles.

Olympic National Park



"Olympic National Park: A Natural History" was first published in 1996. Author Tim McNulty and University of Washington Press have now come out with a fourth edition (2018). It's no wonder this book has been so popular: McNulty is an excellent essayist, and his subject is endlessly fascinating. Easily seen from Seattle on a clear day, Olympic National Park is a 1440-square-mile World Heritage Site and treasure of biodiversity encompassing multiple ecosystems.

This is not an identification book or field guide. (It does have photographs, but they are mostly clustered at the front in order to set the mood.) Instead, this a book for reading, intended to be savored cover-to-cover, and to impart an understanding of the national park's flora and the fauna in their broad settings: the mountains, the forests, and the coast. The author concludes with the human history of the region, especially pre-European, and the much more recent struggle to establish and maintain the integrity of the national park and its ecosystems.

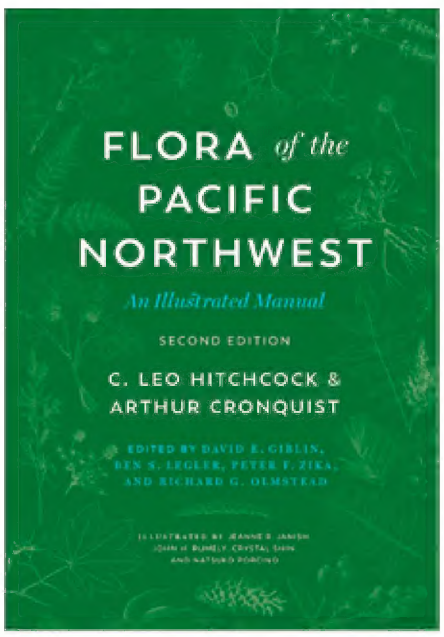
In large part, this newest edition is the same as the previous one (2009), but it includes the story of the removal of dams on the Elwha River. It also provides an update on efforts to restore the animal life found on the Olympic Peninsula prior to the influence of European and eastern North American settlers, including the reintroduction of fishers and the removal of non-native mountain goats.

Olympic National Park is sometimes described as a refugium, a place where plant and animal species have survived while disappearing from nearby locations. Its ability to provide

refuge stems in part from the park's wide range of topographical niches, which result from the extreme changes that take place both in elevation and rainfall over short distances. In recent history, species have been able to adapt to regional environmental changes by moving to suitable nearby habitats.

Earlier history is part of this story, too. While much of the peninsula avoided glaciation, "the ice age and the climatic upheavals that preceded them have reshuffled the deck of plant and animal communities wildly in the Olympic Mountains ... alpine and sub-alpine species mixing willy-nilly with lowland plants and varieties." This gives hope that these mountains and lowlands will continue to provide refuge for plants during future climate change.

Updating Hitchcock



For Pacific Northwest botanists of all levels, the one-volume book informally known as "Hitchcock" has been standard equipment since its publication in 1973. This work, "Flora of the Pacific Northwest: An Illustrated Manual," by C. Leo Hitchcock and Arthur Cronquist, was intended as a field version of the five-volume flora "Vascular Plants of the Pacific Northwest" (written from 1955 to 1969), by the same authors with two additional botanists and two illustrators.

"No scholarly endeavors are immune to the advancing frontiers of knowledge." This quote is from the introduction to the new, second edition of the one-volume "Flora," expanded by a team of four editors and three new illustrators. Changes in taxonomy, especially from molecular studies, plus newly described taxa and the establishment of non-native species (which this flora includes) have created a long-overdue need for an update.

In the 45 years between publications, there has been a nearly 25 percent increase in the number of taxa included, the biggest single reason being "the establishment, or detection, of additional exotic taxa within our area." While this work does not introduce any new names or classifications, just keeping up with widely accepted taxonomic changes has resulted in over 40 percent of the listings in the first edition being assigned a new genus and/or species name, or being placed in a different family.

Hitchcock was a long-time professor of botany at the University of Washington. He was also a gardener, and many of his references regarding the ornamental qualities and garden adaptability of the subjects remain in the second edition. These include the observation that the incense-cedar (*Calocedrus decurrens*) is a fine ornamental tree, and that "trilliums are rather easily grown, and *T. ovatum* in particular is an excellent garden pl [plant], but it is a shame to dig them in the wild, esp [especially] since they grow readily from seed." This urging for conservation (as well as the use of abbreviations) is a repeated theme: "The lilies are a constant temptation to the avaricious gardener, but our spp. [species] rarely thrive in cult [cultivation] and should not be removed from the wild."

Like the first edition, the new book attempts to be comprehensive in its presentation of species, subspecies, and varieties throughout Washington, much of Oregon and Idaho, the western part of Montana, and southern British Columbia. The first edition introduced the new (at the time) idea of embedding the species descriptions and illustrations within the taxonomic keys. This proved to be a good decision. The book has remained a bestseller for the University of Washington Press for the last four decades.

At 882 pages (the first edition had 730), it is perhaps a bit hefty for field work, but the book is a must for your home garden library. The use of abbreviations keeps it from becoming even bigger but can be a bit of a reading challenge at first. After a while, though, the shorthand becomes

familiar. The Miller Library has a lending copy of the new edition and keeps non-circulating copies of both editions and the earlier volumes of "Vascular Plants." Be sure to take a look at this new standard for our regional botany!

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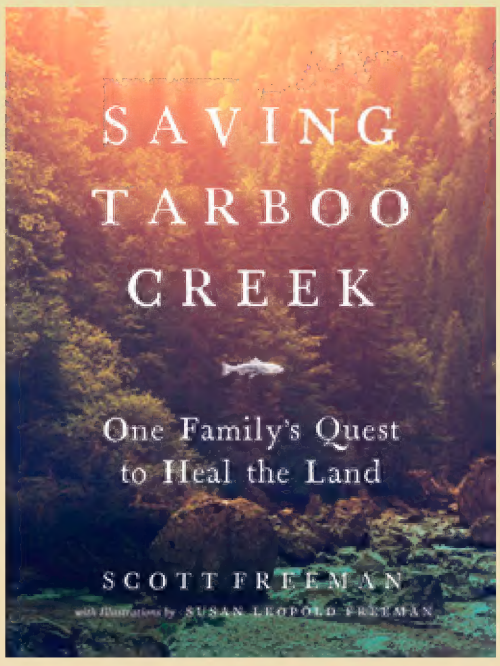
Healing Our Land



"Saving Tarboo Creek" is a local book—by local authors about a local place. The place is Tarboo Creek, which flows north-to-south, roughly five miles east of the boundary of the Olympic National Park, and empties indirectly into the Hood Canal. The authors are Scott Freeman, who teaches biology at the University of Washington, and his wife Susan Leopold Freeman, an artist and also the granddaughter of Aldo Leopold, whose "Sand County Almanac" is a bible for ecologists.

The book is partly a narrative, describing how the Freemans labored over a number of years to restore a patch of land along the creek to its natural state—the one that existed before pioneers straightened the watercourse and harvested most of the trees to create farmland. The book is also a call to arms to those who can act to save and restore natural landscapes.

One of my favorite chapters, one that exemplifies the Freemans' approach, deals with beavers. Of course, beavers can be disastrous to any tree-planting effort, and the Freemans have planted thousands of young trees. The chapter describes clearly, and with some sympathy for the beavers, how the animals live and build and move into new territory like that around Tarboo Creek. Killing them wouldn't help, even if one thought it a good idea, because more beavers would soon show up. Furthermore, beaver dams help make the creek an ideal place for young salmon, a positive effect for the Freemans. So the Freemans (and friends) have painstakingly wrapped trees near the creek with protective wire, and each year they wrap more and more. They expect "an intense beaver chew-down" each March or April, and do the hard labor of saving their young trees.

Each chapter places an aspect of restoration work, such as tree planting, in its historical and ecological context. In the final chapter, directed especially at young people, the Freemans call for a return to a "natural life," proposing four criteria: be engaged, be simple, be real, be present. The book conveys an urgent sense of hope.

Review by Priscilla Grundy, Miller Library volunteer and professor of English Emerita from North Central College, Naperville, Illinois. First published in "The Leaflet," an e-newsletter of the Elisabeth C. Miller Library, in April, 2018.

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